

Algebra 2 GHP Midterm Review 2012

Answers

- 1.) Name all the subsets of the real numbers to which $\sqrt{7}$ belongs.

Irrational, Real

- 2.) Name all the subsets of the real numbers to which 5.33333333 ... belongs.

Rational, Real

- 3.) Name all the subsets of the real numbers to which -18 belongs.

Integer, Rational, Real

- 4.) Simplify: $15 \div 3 + 8 \cdot 7 - 3^3$

34

- 5.) Simplify: $[(3 - 12) + 4 \cdot 3]^3$

27

- 6.) Evaluate for $x = 2$: $\frac{4(x+5) - 2(3x-1)}{x-1}$

18

- 7.) Evaluate for $x = 3$ and $y = -2$: $4x^2y - xy + 3$

-63

- 8.) Name the property illustrated by: $x + 4 = 4 + x$

Comm. Prop. of Add.

- 9.) Name the property illustrated by: $3 + (-3) = 0$

Inverse Prop. of Add.

- 10.) Simplify: $(-2a^3b^5)^3$

$-8a^9b^{15}$

- 11.) Simplify: $\left(\frac{2c}{3}\right)^4$

$\frac{16c^4}{81}$

- 12.) Simplify: $(-3a^2b^3)^2(-a^4b^2)$

$-9a^8b^8$

- 13.) Simplify: $\frac{24a^8b^7}{3a^5b^{13}}$

$\frac{8a^3}{b^6}$

14.) Simplify and write with positive exponents: $(7a^{-3}b^4)^2$

$$\frac{49b^8}{a^6}$$

15.) Simplify and write with positive exponents: $\frac{13x^{-5}y^{-2}}{26x^3y^{-7}}$

$$\frac{y^5}{2x^8}$$

16.) Simplify: $\frac{9a^7b^3}{-12a^5b^5}$

$$-\frac{3a^2}{4b^2}$$

17.) Simplify: $-8^{\frac{2}{3}}$

$$-4$$

18.) Simplify: $(32x^5y^{20})^{\frac{1}{5}}$

$$2xy^4$$

19.) If $f(x) = x^3 - 8$, find $f(3)$.

$$19$$

20.) If $g(x) = 7x - 2$, find $g(2)$.

$$12$$

21.) Find the domain of the relation: $\{(-3, 7), (1, 4), (5, -3), (0, -7)\}$.

$$\{-3, 0, 1, 5\}$$

22.) Is the relation $\{(3, 7), (8, -4), (5, 1), (-2, 7), (0, 1)\}$ a function?

$$\text{yes}$$

23.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $f + g$.

$$3x + 2$$

24.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $f \cdot g$.

$$2x^2 + 5x - 3$$

25.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $f - g$.

$$-x + 4$$

26.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $f \div g$.

$$\frac{x+3}{2x-1}, \quad x \neq \frac{1}{2}$$

27.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $f \circ g$.

$$2x + 2$$

28.) Use $f(x) = x + 3$ and $g(x) = 2x - 1$, find $g(f(4))$.

$$13$$

29.) Use $f(x) = 2x + 7$ and $g(x) = x - 3$, find $g(f(-1))$.

$$2$$

30.) Use $f(x) = 2x + 7$ and $g(x) = x - 3$, find $g(f(-3))$.

$$-2$$

31.) Use $f(x) = 2x + 7$ and $g(x) = x - 3$, find $g(f(0))$.

$$4$$

32.) Use $f(x) = 2x + 7$ and $g(x) = x - 3$, find $f + g$.

$$3x + 4$$

33.) Use $f(x) = 2x + 7$ and $g(x) = x - 3$, find $f - g$.

$$x + 10$$

34.) Find the inverse of $f(x) = 3x + 2$

$$y^{-1} = \frac{1}{3}x - \frac{2}{3}$$

35.) Find the inverse of $f(x) = 3x - 3$

$$y^{-1} = \frac{1}{3}x + 1$$

36.) Let $g(x)$ be any function. Find the equation of the graph that will be obtained if the graph of $y = g(x)$ is translated 5 units to the left and 7 units down.

$$g(x) = |x + 5| - 7$$

37.) Which test is used to determine if the graph of a function is one-to-one? Explain.

Horizontal Line Test

38.) Which test is used to determine if graph of a relation is a function? Explain.

Vertical Line Test

39.) Simplify: $\sqrt{98}$

$$7\sqrt{2}$$

40.) Simplify: $\sqrt{81a^4b^{10}c^8}$

$$9a^2b^5c^4$$

41.) Simplify: $\sqrt{-49}$

$$7i$$

42.) Simplify: i^{70}

$$-1$$

43.) Subtract: $2\sqrt{-8} - 3\sqrt{-18}$

$$-5i\sqrt{2}$$

44.) Multiply: $\sqrt{-8} \cdot \sqrt{-2}$

$$-4$$

45.) Multiply: $(2-3i)(7-2i)$

$$8-25i$$

46.) Subtract: $(-6-2i) - (-3+5i)$

$$-3-7i$$

47.) Rationalize: $\frac{9-i}{3-i}$

$$\frac{14+3i}{5}$$

48.) Factor: $6x^9y^2 - 24x^3y + 3xy$

$$3xy(2x^8y - 8x^2 + 1)$$

49.) Factor: $x^4 - 196$

$$(x^2 + 14)(x^2 - 14)$$

50.) Factor: $4x^2 + 20x + 25$

$$(2x+5)^2$$

51.) Factor: $x^2 + 10x + 3$

Not factorable

52.) Factor: $6x^2 + x - 1$

$$(2x+1)(3x-1)$$

53.) Factor: $8x^3 - 1$

$$(2x-1)(4x^2+2x+1)$$

54.) Factor completely: $5x^2 + 5x - 30$

$$5(x+3)(x-2)$$

55.) Factor completely: $2x^8 - 32$

$$2(x^4 + 4)(x^2 + 2)(x^2 - 2)$$

56.) Factor by grouping: $2x + y + 18x^2 + 9xy$

$$(2x + y)(1 + 9x)$$

57.) Which direction does the graph of $f(x) = -2x^2 + 9$ open?

down

58.) Find the axis of symmetry of $f(x) = x^2 + 6x + 36$.

$$x = -3$$

59.) Find the vertex of $f(x) = x^2 + 6x + 36$.

$$(-3, 27)$$

60.) How is the width of a quadratic function graph determined?

If $|a| > 1$, the graph becomes narrower

If $|a| < 1$, the graph becomes wider

61.) What determines if the quadratic function graph will have a maximum or minimum value?

If a is positive, the parabola has a min.

If a is negative, the parabola has a max.

62.) Find the y-intercept of $f(x) = -x^2 + 4x + 3$.

$$(0, 3)$$

63.) Solve the quadratic: $x^2 + x - 42 = 0$

$$x = \{-7, 6\}$$

64.) Solve the quadratic: $3x^2 + 14x = 5$

$$x = \left\{ \frac{1}{3}, -5 \right\}$$

65.) Solve the quadratic: $2x^2 = 24$.

$$x = \pm 2\sqrt{3}$$

66.) Solve the quadratic: $3x^2 + 12x + 9 = 0$.

$$x = \{-3, -1\}$$

67.) Solve using the quadratic formula: $2x^2 + 5x + 1 = 0$.

$$x = \frac{-5 \pm \sqrt{17}}{4}$$

68.) Complete the square $x^2 - 14x + \underline{\hspace{1cm}}$.

$$49$$

69.) Find the discriminant of $x^2 - 2x - 48 = 0$.

196

70.) Find the number and type of solutions of $x^2 - 2x - 48 = 0$.

2 rational, real solutions